National Digital Forecast Database (NDFD)
Wind Gust Element
Product Description Document
September 6, 2006

Part I - Mission Connection

a. Description of Product - Under statute, the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) is charged to collect data on climate, water, and weather, provide forecasts and warnings of severe weather in order to protect life and property, and create and disseminate forecasts and other weather information for the benefit of a wide range of weather sensitive businesses and activities.

By capitalizing on rapid advances in science and technology and infusing these advances into its operations, the NWS has taken steps to proactively respond to ever changing and growing demands of its customers and partners. The 2003 Fair Weather report, produced by the National Research Council, recommended making NWS data and products available in an Internet accessible digital form. The specific recommendation is as follows: "*Information held in digital databases should be based on widely recognized standards, formats, and metadata descriptions to ensure that data from different observing platforms, databases, and models can be integrated and used by all interested parties in the weather and climate enterprise*."

Since the Internet is now a principal means of communicating NWS forecasts, the NWS provides Internet access to operational and experimental forecasts of base and derived weather elements (e.g., Maximum Temperature, Sky Cover, Relative Humidity) through the National Digital Forecast Database (NDFD). NDFD contains a seamless mosaic of digital forecasts from NWS field offices working in collaboration with the National Centers for Environmental Prediction (NCEP). Additionally, the NWS makes available graphic forecast displays (http://weather.gov/forecasts/graphical/sectors/index.php) that are web-based presentations of digital forecast data originating from local Weather Forecast Office (WFO) digital databases and the NDFD server.

The most recent experimental digital dataset (and associated graphic forecast display) integrated into NDFD is **Wind Gust**. The American Meteorological Society's Glossary of Meteorology defines a wind gust as a sudden brief increase in the speed of the wind. More specifically, the NDFD Wind Gust grid definition accepted by the DSPAC is defined as, **"the maximum 3-second wind speed (in knots) forecast to occur within a 2-minute interval at a height of 10 meters. Wind gust forecasts are valid at the top of the indicated hour."**

b. Purpose – In support of the mission described in the ***National Weather Service Strategic Plan for FY2003 - FY 2008***, the NDFD is a "...national information database and infrastructure which can be used by other governmental agencies, the private sector, the

public, and the global community." The NDFD is the primary means by which digital information will be made available to customers and partners. As part of this digital database, Wind Gust information has been made available in response to growing user needs for planning purposes and critical safety decisions. Future digital datasets will continue to be developed in accordance with growing user needs.

c. Intended Audience - The current audience for the NDFD Wind Gust element includes large volume users of forecast information, the transportation and trucking industry, utilities, emergency managers, government agencies, academia, and recreational users. It is also for anyone else who wishes to decode and explore various potential applications of the NWS digital wind gust data; or simply view, post, or distribute the graphic images.

d. Presentation Method – The NDFD Wind Gust element is available on each of the 16 predefined and slightly overlapping geographic sectors throughout the CONUS, as depicted at the following URL: http://www.weather.gov/ndfd/coverage.htm. Wind Gust forecasts are also available on three OCONUS sectors including Hawaii, Guam, and Puerto Rico/Virgin Islands. In the future, Wind Gust forecasts will also be available for Alaska. The base data is presented in GRIB, Edition 2 format and can be readily decoded for those who wish to create derived products from the forecast parameters/values contained within the NDFD. A user defined GRIB2 access method is also available. This service allows the user to provide latitude/longitude points for two corners and a weather element. A resulting GRIB2 message is built "on-the-fly" and downloaded by the user. For more information about User Defined GRIB2 access, please refer to the Products/Service Description Document at the following URL:

http://products.weather.gov/PDD/User_Defined_Grib2.pdf

In addition, Wind Gust forecast data is available in Extensible Markup Language (XML). XML is a service that provides the ability to request NDFD data over the internet and receive the information back in an XML format. The request/response process is made possible by the NDFD XML Simple Object Access Protocol (SOAP) server. For additional details regarding XML, please refer to the NDFD XML Service Description Document at the following URL:

http://products.weather.gov/PDD/Extensible_Markup_Language.pdf

Finally, Wind Gust forecasts are presented as web-based graphic images. These images follow a standard format prescribed by the NWS to best meet the needs of its customers and partners. When selected by the user (via a mouse click on the national mosaic), regional mosaics provide images for 16 predefined and slightly overlapping geographic sectors throughout the CONUS, as depicted at the following URL:

http://www.weather.gov/ndfd/coverage.htm.

For CONUS locations, an additional mouse click will drill down to graphics for each state. One final mouse click will zoom to individual WFO County Warning and Forecast areas. Most OCONUS sectors also have limited zoom capability. For each geographic level of display, the user may select the weather element and time period to display, and

create animations of the images.

e. Feedback Mechanism - We are always seeking to improve our products based on user feedback. Please submit your comments on these experimental elements by completing our brief experimental product survey. During the Wind Gust comment period specified in Table 1 below. Comments may also be submitted by clicking on the "Survey/Comments" links on the experimental product web pages. For general questions regarding the National Digital Forecast Database, please email: ***nws.ndfd@noaa.gov***

Graphic Element	Comment Open Date	Comment Close Date
Wind Gust	9/6/06	3/06/07

Table 1. NDFD Wind Gust forecast Comment Period

Technical questions regarding the NDFD Wind Gust element may be addressed to:

National Weather Service Headquarters
ATTN: David Ruth, W/OST21
1325 E-W Highway, SSMC2
Silver Spring, MD 20910

Part II - Technical Description

a. Format & Science Basis - The Wind Gust grid forecasts are prepared and revised at the local WFOs on an event-driven basis. These grids are regularly uploaded to the NDFD server where new graphic mosaics are generated. The Wind Gust element contains the total wind forecast at the temporal and spatial resolution of the NDFD database from zero to 72 hours. The value of the wind gust grid will always equal or exceed the value of the sustained wind speed grid. **When wind gusts are not forecast for a particular hour, the Wind Gust grid will assume the value of the sustained wind forecast grid.** In this instance, the maximum 3-second wind speed is equal to the mean wind speed during that 2 minute interval.

The NDFD Wind Gust forecast element was developed in coordination with NWS experts representing Marine/Tropical, Public, Aviation, and Fire Weather service areas in an effort to best meet the diverse user needs. The Wind Gust definition has been created to correspond to a majority of current NWS observational platforms, and contains aspects preferred by wind engineers for use in building designs.

b. Product Availability – The latest NDFD Wind Gust forecast element has been made continuously available via file transfer protocol (ftp), eXtensible Markup Language (XML), or web browser. To access the Wind Gust forecast data, or for further availability and technical information (e.g., temporal and spatial resolutions, forecast projections, and geographic coverage) please visit the following URL:

http://www.weather.gov/ndfd/technical.htm

Wind Gust images may also be accessed from the NWS homepage, www.weather.gov,

and clicking on the “Graphical Forecasts” tab, or directly at the following URL:
http://weather.gov/forecasts/graphical/sectors/index.php

c. Additional Information –

(1) For more information on the NDFD, please refer to the NDFD Information web site at the following URL: http://www.nws.noaa.gov/ndfd/index.htm

(2) Experimental gridded elements are differentiated from operational elements by their file access locations. Graphic elements are differentiated from NWS operational elements by the “experimental” label found on the individual graphics.

(3) Experimental elements are evaluated on both objective (e.g., statistical and technical aspects), and subjective (e.g., internal and external feedback) criteria.